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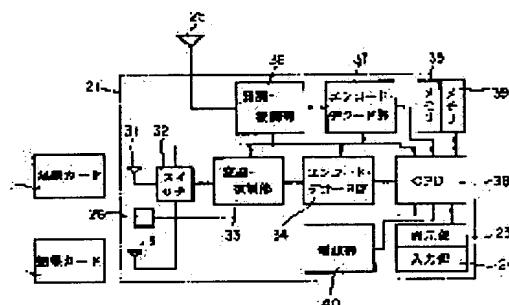
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## (54) RADIO MEDIUM PROCESSOR

## (57)Abstract:

**PURPOSE:** To provide a radio medium processor which is capable of performing communication between plural radio cards and a radio card reader/writer at the same time and in short time.

**CONSTITUTION:** When each radio card 1 is inserted in and set to plural card insertion slots, a reset switch 26 detects the insertion and set and a memory 35 for radio card is reset. Subsequently, a CPU 38 reads each data stored in the memory of each radio card 1 by performing each radio communication with each set radio card 1, and stores each read data in the memory 35 for radio card. Afterwards, the CPU 38 performs communication by radio with a radio card reader/writer based on the data stored in the memory 35 for radio card. After a communication processing is terminated, the radio card 1 is taken out from the card insertion slot. At this time, the reset switch 26 detects the take-out and the memory 35 for radio card is reset.



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CLAIMS

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## [Claim(s)]

[Claim 1] The radio medium processor characterized by providing the following. The radio medium set section to which 1st storage means by which each memorizes data, and two or more radio media which have the radio function which transmits and receives data by radio are set. A data reading means to read the data memorized by the storage means of the above 1st of each radio medium by performing radio, respectively between each radio medium set to this radio medium set section, respectively. The 2nd storage means which memorizes the data of each aforementioned radio medium read with this data reading means, respectively. A radio means to perform communication by radio between external devices based on the data memorized by this 2nd storage means.

[Claim 2] The radio medium processor characterized by providing the following. The radio medium set section to which 1st storage means by which each memorizes data, and two or more radio media which have the radio function which transmits and receives data by radio are set. A data reading means to read the data memorized by the storage means of the above 1st of each radio medium by performing radio, respectively between each radio medium set to this radio medium set section, respectively. The 2nd storage means which memorizes the data of each aforementioned radio medium read with this data reading means, respectively. A data-processing means to perform predetermined data processing and to memorize the processing result for the storage means of the above 2nd by performing communication by radio between external devices based on the data memorized by this 2nd storage means, By performing radio, respectively between each radio medium set to the aforementioned radio medium set section based on the data memorized by the storage means of the above 2nd, after data processing by this data-processing means is completed The data write-in means which writes predetermined data in the storage means of the above 1st of each radio medium, respectively.

[Claim 3] The radio medium processor characterized by providing the following. The radio medium set section to which 1st storage means by which each memorizes data, and two or more radio media which have the radio function which transmits and receives data by radio are set. A data reading means to read the data memorized by the storage means of the above 1st of each radio medium by performing radio, respectively between each radio medium set to this radio medium set section, respectively. The 2nd storage means which memorizes the data of each aforementioned radio medium read with this data reading means, respectively. Resetting means which detect it and reset the content of storage of the

storage means of the above 2nd in case a radio medium is set to a radio means to perform communication by radio, and the aforementioned radio medium set section, based on the data memorized by this 2nd storage means between external devices, and in case the set radio medium is taken out.

[Claim 4] The radio medium processor characterized by providing the following. The radio medium set section to which two or more radio media in which each has the radio function which transmits and receives data, and has relevance mutually by the 1st storage means which memorizes the data which have relevance mutually, and radio are set. A data reading means to read the data memorized by the storage means of the above 1st of each radio medium by performing radio, respectively between each radio medium set to this radio medium set section, respectively. The 2nd storage means which memorizes the data of each aforementioned radio medium read with this data reading means, respectively. A radio means to perform communication by radio between external devices based on the data memorized by this 2nd storage means.

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#### DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Industrial Application] this invention relates to the radio medium processor which makes communication possible simultaneously between two or more radio cards (radio medium) which are mutually relevant, for example, and a single radio card reader writer (external device).

[0002]

[Description of the Prior Art] In recent years, the radio card for individual recognition is spreading. This kind of radio card has the memory which memorizes data, and the radio function which transmit and receive data between radio card reader writers by radio, for example, is constituted by the IC card etc., and, generally one radio card is given to one individual or one body.

[0003] However, one individual considers assigning a radio card to two or more radio cards and one body also at the device which people with two or more radio cards or radio cards use recently. For this reason, it is necessary to recognize simultaneously the identification code of the device which an individual and an individual use.

[0004] However, generally to one radio card, only one radio card reader writer can communicate no longer. So, when two or more radio cards were used, one radio card [ one ]

needed to be separately held up to the radio card reader writer, and communications processing including individual recognition processing had taken the long time.

[0005] Since it cannot communicate simultaneously among one radio card reader writer in case two or more radio cards which have relevance mutually especially, for example, two or more radio cards with which one individual's data divide and are memorized, are used, it is necessary to hold up one radio card [ one ] to a radio card reader writer separately, and it will be very troublesome and about [ being inconvenient ] and communications processing will take a long time each time.

[0006]

[Problem(s) to be Solved by the Invention] Thus, conventionally, when communicating two or more radio cards, it is necessary to communicate by holding up one radio card [ one ] to a radio card reader writer separately. Therefore, there was a problem of it having been very troublesome and starting about [ being inconvenient ] and communications processing for a long time.

[0007] Then, this invention aims simultaneous at offering the radio medium processor which can moreover communicate in a short time between two or more radio media and a single external device.

[0008]

[Means for Solving the Problem] The radio medium set section to which, as for the radio medium processor of this invention, two or more radio media by which each has 1st storage means to memorize data, and the radio function of transmitting and receiving data by radio are set, By performing radio, respectively between each radio medium set to this radio medium set section A data reading means to read the data memorized by the storage means of the above 1st of each radio medium, respectively, The 2nd storage means which memorizes the data of each aforementioned radio medium read with this data reading means, respectively, and a radio means to perform communication by radio between external devices based on the data memorized by this 2nd storage means are provided.

[0009] Moreover, the radio medium set section to which, as for the radio medium processor of this invention, two or more radio media by which each has 1st storage means to memorize data, and the radio function of transmitting and receiving data by radio are set, By performing radio, respectively between each radio medium set to this radio medium set section A data reading means to read the data memorized by the storage means of the above 1st of each radio medium, respectively, The 2nd storage means which memorizes the data of each aforementioned radio medium read with this data reading means, respectively, A data-processing means to perform predetermined data processing and to memorize the processing result for the storage means of the above 2nd by performing communication by

radio between external devices based on the data memorized by this 2nd storage means, By performing radio, respectively between each radio medium set to the aforementioned radio medium set section based on the data memorized by the storage means of the above 2nd, after data processing by this data-processing means is completed The data write-in means which writes predetermined data in the storage means of the above 1st of each radio medium, respectively is provided.

[0010] Moreover, the radio medium set section to which, as for the radio medium processor of this invention, two or more radio media by which each has 1st storage means to memorize data, and the radio function of transmitting and receiving data by radio are set, By performing radio, respectively between each radio medium set to this radio medium set section A data reading means to read the data memorized by the storage means of the above 1st of each radio medium, respectively, The 2nd storage means which memorizes the data of each aforementioned radio medium read with this data reading means, respectively, A radio means to perform communication by radio between external devices based on the data memorized by this 2nd storage means, In case a radio medium is set to the aforementioned radio medium set section, and in case the set radio medium is taken out, the resetting means which detect it and reset the content of storage of the storage means of the above 2nd are provided.

[0011] Furthermore, 1st storage means by which, as for the radio medium processor of this invention, each memorizes the data which have relevance mutually, And the radio medium set section to which two or more radio media which have the radio function which transmits and receives data and have relevance mutually by radio are set, By performing radio, respectively between each radio medium set to this radio medium set section A data reading means to read the data memorized by the storage means of the above 1st of each radio medium, respectively, The 2nd storage means which memorizes the data of each aforementioned radio medium read with this data reading means, respectively, and a radio means to perform communication by radio between external devices based on the data memorized by this 2nd storage means are provided.

[0012]

[Function] According to this invention, moreover, it can communicate simultaneously between two or more radio media and a single external device in a short time by reading and memorizing data from each radio medium, respectively, and performing communication by radio between external devices based on each of this memorized data by receiving two or more radio media simultaneously, and performing radio between each radio medium, respectively.

[0013] Moreover, it becomes possible to read in a radio medium and to prevent the

unauthorized use of the memorized data etc. by resetting the data which read in the radio medium and were memorized at the time of the set of a radio medium, and extraction of the set radio medium.

[0014]

[Example] Hereafter, one example of this invention is explained with reference to a drawing. Drawing 4 shows the internal configuration of the radio card as a radio medium concerning this example. That is, the radio card 1 is constituted by an antenna 2, a switch 3, modulation / recovery section 4, I/O control unit 5, the memory 6 as a storage means, CPU (central processing unit) 7, the rectification section 8, the battery 9, etc., and among these, each part except a battery 9 is integrated-circuit-ized, and is laid underground in the main part of a card.

[0015] An antenna 2 performs transmission and reception by the electric wave between radio card reader writers, radio card processors, etc. which are mentioned later. A switch 3 switches an antenna 2 alternatively to modulation / recovery section 4 or the rectification section 8, connects, and is controlled by CPU 7.

[0016] Modulation / recovery section 4 modulates a sending signal, or restores to an input signal. I/O control unit 5 changes transmit data into a regular signal, or changes into regular data the input signal to which it restored. Memory 6 is used for various data storages. CPU 7 controls each part or performs various kinds of data processing etc.

[0017] The rectification section 8 rectifies the charge electric wave received through the antenna 2, transforms it into electrical energy, and charges a battery 9 with the electrical energy. A battery 9 is a power supply of operation which supplies operating voltage, and can charge each part.

[0018] Drawing 5 shows roughly the composition of the radio card reader writer as an external device which performs the radio card concerning this example, and radio. That is, the radio card reader writer 11 is constituted by an antenna 12, modulation / recovery section 13, I/O control unit 14, the memory 15 as a storage means, CPU 16, the terminal unit 17, etc.

[0019] An antenna 12 performs transmission and reception by the electric wave between the radio card 1 mentioned above, the radio card processor mentioned later. Modulation / recovery section 13 modulates a sending signal, or restores to an input signal. I/O control unit 14 changes transmit data into a regular signal, or changes into regular data the input signal to which it restored.

[0020] Memory 15 is used for various data storages. CPU 16 manages overall control. A terminal unit 17 performs various kinds of data processing etc., and the personal computer etc. is used.

[0021] Drawing 2 shows the appearance of the radio card processor which processes the radio card concerning this example. That is, while the card insertion slots 22 and 22 by which the radio card processor 21 inserts the radio card 1 of plurality (this example two pieces) in the unilateral section are established, the control units 24, such as the liquid crystal display section 23 which displays operating state etc., and a keyboard, are formed in the front face. Moreover, the antenna 25 is set up by the unilateral section of others [ processor / radio card / 21 ].

[0022] In addition, a control unit 24 can input now the program of CPU38 mentioned later etc. so that it can respond to various radio cards. Moreover, an antenna 25 is an antenna only for [ with the radio card reader writer 11 ] communications.

[0023] Drawing 3 shows typically the composition in the card insertion slot 22 of the radio card processor 21, and 22. While the reset switches 26 and 26 operated with the inserted radio card 1 are formed in the card insertion slot 22 and the entrance section in 22, the card insertion check sections 27 and 27 operated with the inserted radio card 1 are formed in the pars basilaris ossis occipitalis in the card insertion slot 22 and 22.

[0024] That is, if the radio card 1 is inserted in the card insertion slot 22, a reset switch 26 turns on the radio card 1 by pushing up the control unit of a reset switch 26, and a reset signal will occur and will reset the content of the memory 35 for radio cards mentioned later. furthermore -- if the radio card 1 is inserted -- the point of the radio card 1 -- the card insertion check section 27 -- pushing in -- just -- being alike -- if inserted to the position where the control unit of a reset switch 26 is not pushed up, a reset switch 26 turns off In this state, the radio card 1 and the radio card processor 21 communicate with the radio card reader writer 11.

[0025] On the other hand, the radio card 1 is extruded by extruding the card insertion check section 27 by the extruder style (not shown) which operates by the card eccrisis signal inputted from a control unit 24 at the time of extraction of the radio card 1. Thereby, a reset switch 26 turns on the radio card 1 by pushing up the control unit of a reset switch 26 again, and a reset signal occurs and resets the content of the memory 35 for radio cards mentioned later.

[0026] The data in the memory 35 for radio cards are reset by the above except the time of insertion of the radio card 1, and it is possible to prevent improper use of data. Drawing 1 shows the composition of the radio card processor 21. The radio card processor 21 The radio card 1 and communication The switch 32 which switches the antennas 31 and 31 for radio cards for carrying out, and the antennas 31 and 31 for radio cards, modulation / recovery section 33 for radio cards, the encoding decoding section 34 for radio cards, the memory 35 for radio cards (storage means), modulation / recovery section 36 for reader



writers, It is constituted by the main memory 39 which memorizes the program of CPU38 and CPU38 which manage the encoding decoding section 37 for reader writers, and overall control etc., a power supply section 40 and the aforementioned liquid crystal display section 23, the control unit 24, the reset switch 26, etc.

[0027] That is, if the radio card 1 is inserted in the card insertion slot 22, when the radio card 1 pushes a reset switch 26, the content of the memory 35 for radio cards will be reset.

[0028] The antenna 31 for radio cards reads the data of the memory 6 in the radio card 1 by radio. After being sent to modulation / recovery section 33 for radio cards in order and getting over by the change of a switch 26 here, the read data are coded by the encoding decoding section 34 for radio cards, are processed in CPU38, and are memorized by the memory 35 for radio cards.

[0029] It is data-ized by the encoding decoding section 37 for reader writers, modulation / recovery section 36 for reader writers becomes irregular, and the data memorized by the memory 35 for radio cards are transmitted to the exterior by the antenna 25 for reader writers.

[0030] On the other hand, it is received by the antenna 25 for reader writers, and gets over by modulation / recovery section 36 for reader writers, and the signal transmitted from the radio card reader writer 11 is coded by the encoding decoding section 37 for reader writers. The coded data are processed in CPU38 by referring to the data of the memory 35 for radio cards.

[0031] After the communications processing of such a series of radio card reader writers 11 and the radio card processor 21 is completed, the communications processing data is memorized by the memory 35 for radio cards. It is data-ized by the encoding decoding section 34 for radio cards, modulation / recovery section 33 for radio cards becomes irregular, and the data memorized by the memory 35 for radio cards are memorized through a switch 32 and an antenna 31 by the memory 6 in the radio card 1 set.

[0032] It becomes possible to perform communication between the radio card reader writer 11 and two or more radio cards 1 for a short time simultaneous according to such a process. The radio card 1 which ended communication is taken out from the card insertion slot 22. In that case, the radio card 1 pushes a reset switch 26, and the memory 35 for radio cards is reset.

[0033] Drawing 6 and drawing 7 show the flow chart of data processing of the radio card processor 21, and explain processing operation with reference to this flow chart hereafter. If the radio card 1 is inserted in the card insertion slot 22, when the radio card 1 pushes a reset switch 26, a reset signal will be sent to CPU38. Then, CPU38 resets the content of the memory 35 for radio cards, and performs data communication between the radio cards 1

after that.

[0034] That is, CPU38 reads data in the memory 6 of the radio card 1 by performing radio between the radio cards 1. CPU38 which read the data of the radio card 1 performs data processing as shown in drawing 8 , and memorizes it in the memory 35 for radio cards. CPU38 shall perform communication with the radio card reader writer 11 and the radio card processor 21 with reference to the content of this memory 35 for radio cards.

[0035] CPU38 which finished communication with the radio card reader writer 11 can write the communication data memorized by the memory 35 for radio cards in the memory 6 of the radio card 1 by communicating with the radio card 1.

[0036] After the data of communication on the radio card 1 are memorized, the radio card 1 is taken out. Under the present circumstances, by pushing in a reset switch 26, the memory 35 for radio cards is reset and, thereby, the radio card 1 can prevent the unauthorized use of data.

[0037] The example of data processing of the radio card 1 is shown in drawing 8 or drawing 10 . For example, it roughly divides into processing of the data of two radio cards 1, and three kinds are considered. First, as shown in drawing 8 , it is the method of combining the data of the radio card A and the radio card B by turns, and using as the data of the radio card processor 21. The data of the radio card processor 21 have the processing command C peculiar to the radio card processor 21 (start), and let them be the data structure the discernment data A of the radio card A, the discernment data B of the radio card B, the radio card data A, the radio card data B, the processor data C, and processing command C' (end).

[0038] Next, as shown in drawing 9 , the data of the radio card A are gathered in a head, and the data of the radio card B have the method of packing into the degree. Finally, as shown in drawing 10 , there is a method of the radio card processor 21 having discernment data of self, and performing communication with the radio card reader writer 11 by making this into the discernment data C. Although the radio card processor 21 recognizes the discernment data A and B of the radio cards A and B, the discernment data C which self has are used for it, without making this into discernment data. In addition, let the data of the radio cards A and B be a thing like drawing 9 which accumulates and takes a formula or a mutual insertion formula.

[0039] Thus, by according to the above-mentioned example, receiving two or more radio cards simultaneously, and performing radio between each radio card, respectively By performing communication by radio between radio card reader writers based on each data which read data in each radio card, respectively, memorized in memory, and was memorized in this memory Moreover, it can communicate simultaneously in a short time between two or more radio cards and one radio card reader writer.

[0040] Therefore, it is not necessary to hold up separately two or more one radio card [ one ] to a radio card reader writer, and like before, it is very easy and the time which about [ being convenient ] and communications processing takes can be shortened remarkably each time. A remarkable effect can be demonstrated to two or more radio cards which have relevance mutually especially.

[0041] Moreover, by preparing the reset switch which operates according to insertion-and-detachment operation of a radio card, and resetting the data which read in the radio card at the time of insertion of a radio card and extraction of a radio card, and were memorized in memory, it reads in a radio card, becomes possible to prevent the unauthorized use of the data memorized in memory etc., and becomes the thing excellent also in security nature.

[0042]

[Effect of the Invention] As explained in full detail above, according to this invention, the radio medium processor which can moreover communicate in a short time can be simultaneously offered between two or more radio media and a single external device.

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